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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,250	05/12/2006	Hee-Joo Jeon	NEK-0031	7111
23413	7590	04/05/2007		
CANTOR COLBURN, LLP 55 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002			EXAMINER CHEUNG, WILLIAM K	
			ART UNIT	PAPER NUMBER
			1713	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		04/05/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/579,250

Applicant(s)

JEON ET AL.

Examiner

William K. Cheung

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9-26 is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☒ Claim(s) 3-8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>112906</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tachibana et al. (US 4,035,563) as evident by Gloesener et al. (US 5,214,092).

The invention of claims 1-8 relates to a **nano calcium carbonate/vinyl chloride monomer dispersion** comprising a vinyl chloride monomer, **nano calcium carbonate** and a **lipophilic dispersing agent**.

The invention of claims 9-17 relates to a method for preparing a PVC based nanocomposite resin composition comprising the steps of:

(a) adding nano calcium carbonate and a lipophilic dispersing agent to a vinyl chloride monomer to disperse them;

(b) adding the resultant mixture system to an aqueous solution system comprising deionized water, a suspension stabilizer and a polymerization initiator to prepare a suspension system and polymerizing the suspension system at an elevated temperature to prepare a PVC based on a nanocomposite resin composition; and

(c) processing the PVC based nanocomposite resin composition including an impact modifier to produce extruded articles.

The invention of claims 18- 26 relates to a **method for preparing a PVC based nanocomposite resin composition** comprising the steps of:

(a) **adding nano calcium carbonate, a lipophilic dispersing agent and a polymerization initiator to a vinyl chloride monomer** to disperse them;

(b) adding the resultant mixture system to an aqueous solution system comprising deionized water and a suspension stabilizer to prepare a suspension system and performing polymerization at an elevated temperature to prepare a PVC based nanocomposite resin composition; and  
(c) processing the PVC based nano composite resin composition including an impact modifier to produce extruded articles.

Tachibana et al. (col. 5, line 15-47) disclose a process for preparing a dispersion comprising adding a water soluble metallic salt, which include calcium carbonate as a water soluble metallic salt. Although Tachibana et al. disclose that amount of calcium carbonate used is 100 ppm to water, when the such concentration of calcium carbonate solution is added to the vinyl chloride monomers with other ingredients such as methanol, initiator (col. 1, line 12) and suspension stabilizer (col. 1, line 12), which would lower the solubility characteristics of calcium carbonate in water, causing the calcium carbonate to precipitate. As evident in Gloesener et al. (col. 2, line 67 to col. 3, line 2), the precipitation of calcium carbonate is an easy method for making nano-size particles of calcium carbonate. In view of the evidence of Gloesener et al., the examiner has a reasonable basis to believe that the process of Tachibana et al. also involve the precipitation of the calcium carbonate while preparing a mixtures comprising vinyl chloride monomers in the presence of lipophilic dispersing agents. Since the PTO does not have proper means to conduct experiments, the burden of proof is now shifted to applicants to show otherwise. In re Best, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977); In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

Regarding the claimed lipophilic dispersion agents, Tachibana et al. (col. 1, line 12) clearly disclose the use of suspension stabilizer as well as initiator.

***Allowable subject matter***

3. Claims 3-8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. Claims 9-26 are allowed.

5. The following is an examiner's statement of reasons for allowance:

As of the date of this office action, the examiner has not located or identified any reference that can be used singularly or in combination with another reference including the closest prior art of Gloesener et al. (US 5,214,092) to render the present invention anticipated or obvious to one of ordinary skill in the art. Gloesener et al. only disclose a polymer dispersion comprising nano calcium carbonate, not the monomer dispersion as claimed.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William K. Cheung whose telephone number is (571)

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272-1097. The examiner can normally be reached on Monday-Friday 9:00AM to 2:00PM; 4:00PM to 8:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David WU can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



William K. Cheung, Ph. D.

Primary Examiner

March 30, 2007

**WILLIAM K. CHEUNG  
PRIMARY EXAMINER**